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BIOINFORMATICS AND BIOTECHNOLOGY – TWO SIDES OF THE SAME ANALYSIS*

Keywords: biotechnology, bioinformatics, gene expression, KEGG Pathway, Protein-Protein interactions.

Biotechnology and bioinformatics are two important fields of research in recent times. Databases (NCBI, TCGA, and Ensemble Swiss Port) are used to obtain datasets (DNA, RNA, and PROTEIN) and are analyzed through bioinformatics programs [1]. The Cancer Genome Atlas (TCGA) is a comprehensive genomic database that holds data for >20 types of cancer obtained from thousands of patients. Data in TCGA include whole-genome measurements of multiple genomic features, including DNA copy numbers, DNA methylation, and gene and microRNA expression, thereby assisting researchers in assessing cancer mechanisms at multiple molecular and regulatory levels [2]. Furthermore, TCGA data is open access and available to all researchers in individual work settings. Bioinformatics techniques are also used to analyze the sequencing results of the Next Generation Sequencing [3]. Bioinformatics analysis of gene expression profiles has shown remarkable promise in uncovering potential key genes and pathways in complex diseases [4]. Gene expression datasets can be obtained from different databases and various bioinformatics tools can be used through language programs such as (R, Python). The results in such analysis show the DEG, PPI, and KEGG Pathway analysis during that specific diseases and disorders [5, 6]. Mutational analysis and proteomics is currently an advanced approach of bioinformatics in clinical research [7]. In conclusion, bioinformatics approaches in different natural science and medical science fields will vast the research interest as well as in medical science it can be used in different diagnostic, drug, and vaccine development studies.

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BIOLOGICAL PROPERTIES OF EXTRACTS FROM LOCALLY GROWN BANANA LEAVES INDICATE THEIR POSSIBLEUSE FOR WOUND DRESSING IN ARUSHA, TANZANIA

Keywords: wound dressing, banana leaves, phytoconstituents, biological properties.

The current study assessed biological properties and safety profile of extracts from locally grown banana leaves in Arusha (Tanzania), to affirm their possible use for wound dressing. Preliminary screening for phytoconstituents in extracts from studied banana plant species, *ijuhi inkundu (IJ) mlelembo (ML)* and *kimalindi (KIM)*, revealed presence of various secondary metabolites *viz*. *anthraquinones, alkaloids, flavonoids, tannins, terpenoids, phenols, phytosterol and saponins*. These phytoconstituents are known to have medicinal values. Antimicrobial activities of three banana varieties were tested against six pathogenic microorganisms. Susceptibility of microorganisms to studied banana varieties were in the order of KIM > ML > IJ, with average MIC of 1.51±0.17, 4.65±1.25, 6.27±2.36 mg/mL respectively, with *kimalindi* being more effective than the rest of studied plants ($p < 0.05$). This finding suggests that *kimalindi* leaves present the best option when used to dress wounds, as it has better antimicrobial property compared to other two studied leaf extracts. One-way analysis of variance (ANOVA) revealed a statistical difference of mean among all extracts ($p < 0.05$), whereby the effectiveness of plant extracts against tested microorganisms were in the order of KIM > IJ> ML, suggesting that *kimalindi* extracts had better effect